

EPEC

YOUR CHALLENGE, OUR INSPIRATION

TELEMATICS SYSTEMS



AUTONOMOUS AND
ASSISTANCE SYSTEMS

CONTROL SYSTEMS

ELECTRIC AND HYBRID
ELECTRIC SYSTEMS



Epec is a system supplier specializing in advanced electrics /electronics for efficient, safe and connected non-road mobile machines (NRMM) and commercial vehicles. Epec is a manufacturing company with extensive experience in control systems, customized products, electric vehicle systems and assistance and autonomous systems.

Since 1978, Epec's diverse experience is based on long term cooperation with leading international OEM's in different sectors. The strength of the company is the combination of innovative and reliable products and services, the know-how of new technology, extensive project management and service experience from different types of applications and operating environments.

– Being close to our customers, we continuously co-create and innovate value adding sustainable future technology solutions that makes a difference.

Epec offices:

- Finland: Seinäjoki (HQ), Tampere, Turku, Kuopio
- The Netherlands: Barendrecht
- USA: Milwaukee
- China: Shanghai

+ **Epec distributors around the world**

QUALITY

- Epec's organization and processes have been fine tuned to cooperate with large international customers
- Manufacturing and design according to highly demanding standards in Finland:
 - ISO 9001 Quality certificate
 - ISO 14001 Environmental certificate
 - ISO 27001 Information security management certificate
 - ISO 45001 Occupational health and safety certificate
 - IATF 16949 compliant operations



EPEC OFFERING

Delivering proven technology for off-highway and commercial vehicle industry to enable zero emissions

- System solutions for mobile machines & commercial vehicles
- Sustainable manufacturing in Finland for global OEMs
- Customized products and turnkey solutions supporting different system architectures

VALUE ADDED SERVICES

- Application SW development
- Simulation based systems engineering



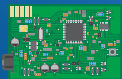
DISPLAYS



TELEMATICS



SOFTWARE PRODUCTS



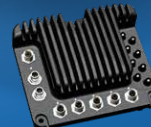
CONTRACT MANUFACTURING



BMS BATTERY MANAGEMENT SYSTEMS



PDU TRACTION VOLTAGE POWER DISTRIBUTION UNITS



AUTONOMOUS & ASSISTANCE SYSTEMS



CONTROL SYSTEMS

SEAMLESS OPERATIONS. ZERO EMISSIONS. ELECTRIFIED FUTURE.

Epec Flow is a comprehensive and customizable solution for electrifying non-road mobile machines / commercial vehicles, optimizing their performance and improving total cost of ownership.



For more information about Epec Flow,
visit epec.fi/systems/epec-flow/



Epec Value Added Services

- Application SW Development
- Simulation Based Systems Engineering

Epec Products



Displays



Control
Units



Telematics

Various Suppliers



Battery



Gear Box



Inverter



Motor



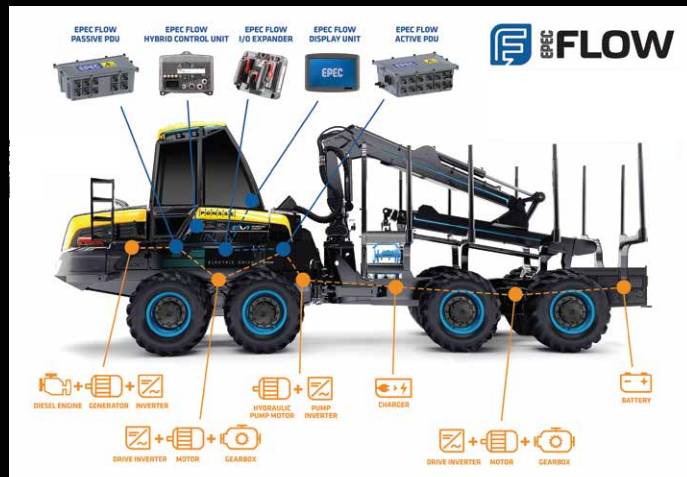
Charger

Epec Flow Power
Distribution Units

Epec Flow use case: PONSSE EV1

A FORWARDER RUNNING ON ELECTRICITY

PONSSE EV1 is a concept forwarder equipped with completely electric drive. Powered by the advanced Epec Flow electrification system, PONSSE EV1 successfully combines responsibility with productivity in modern forestry.



For more information about PONSSE EV1,
visit epec.fi/ponsse-ev1/

FLOW Passive PDU

**CONNECTING MACHINE'S / VEHICLE'S
HIGH VOLTAGE SYSTEM
IN A SAFE AND CONTROLLED WAY**

- Traction Voltage Power Distribution Unit
- PDU can be equipped optionally with system insulation measurement unit
- Seamless integration with main systems and components such as motors and batteries
- Secures traction voltage cables in overload situations working as electric safety element in high voltage system
- Water cooling for reaching high performance
- Scalable for different solutions by variability of the connections
- Designed for very harsh environment
- Fully validated compact solution for machines and vehicles
- Equipped with Automotive certified components

Feature	Value
Operating Voltage	500-900 V
Operating Current	500 A (RMS)
HV Connections	max 7 x High Current, 5 x Low Current
Protection	Insulation monitoring: Full HV system monitoring HVIL Circuit: Covers and connectors included
Output power (continuous)	375 kW



Download more detailed
technical one pager at epec.fi



EPEC FLOW Active PDU

**CONNECTING MACHINE'S / VEHICLE'S
HIGH VOLTAGE SYSTEM
IN A SAFE AND CONTROLLED WAY**

- Traction Voltage Power Distribution Unit
- Controls powertrain DC-link by main contactors
- Integrates and communicates with the machine / vehicle communication system for current flow and voltage monitoring
- Seamless integration with main systems and components such as motors and batteries
- Secures traction voltage cables in overload situations working as electric safety element in high voltage system
- Supports DC charging according to CCS II / ISO 15118
- Scalable for different solutions by variability of the connections
- Designed for very harsh environment
- Fully validated compact solution for machines and vehicles
- Equipped with Automotive certified components
- Epec SW & Solution support

Feature	Value
Operating Voltage	500-900 V
Operating Current	500 A (RMS)
HV Connections	max 4 x High Current, 5 x Low Current
Battery Connection	Main contactors for battery I/O separation Pre-charging circuit
Protection	Insulation monitoring: Full HV system monitoring HVIL Circuit: Covers and connectors included
Sensors	Voltage (Battery and HV grid), Current (Battery and HV grid), Temperature
Output power (continuous)	375 kW
DC Charging	250 A
Communication Protocols	CANopen, SAE J1939



Download more detailed
technical one pager at epec.fi










EPEC Control Units

- Embedded control units for mobile machines enabling different control system architectures and solutions
- All units include status LED/LEDs offering quick status information
- Epec SW & Solution support streamlining the development work and enabling for example IoT and fleet management
- CODESYS / C programmable
- Customized products according to user needs
- Turn-key solutions according to user needs
- Sustainable manufacturing according to high-quality standards in Finland



For more information about Epec and our control products offering, visit epec.fi



Product	Epec EC44 Control Unit Epec EC44 Agri Control Unit Epec GC44 Responder Unit	Epec SL84 Safety Unit	Epec GL84 Responder Unit	Epec XS6C Central Unit	Epec 6200 Remote Access Unit	Epec SL8X Unit	Epec Core Unit	UP COM ING
								
Highlights	<ul style="list-style-type: none"> • Compact • EC44 Agri Control version with larger memory can be used as an ISOBUS gateway/ECU in agriculture implements 	<ul style="list-style-type: none"> • PL d Cat 2 / SIL 2 • Epec pre-certified safety libraries and a tool chain for creating an application 	<ul style="list-style-type: none"> • Safety cut-off feature PL d Cat 3 / SIL 2 (in combination with an external safety system) • High-performance CANopen slave 	<ul style="list-style-type: none"> • Powerful iMX6 Dual/Quad 800 MHz processor • Up to 32 GB Flash, 1 GB RAM 	<ul style="list-style-type: none"> • Powerful iMX6 Dual/Quad 800 MHz processor • Up to 32 GB Flash, 1 GB RAM • Enables IoT and telematics • Linux OS & Microsoft Azure IoT Edge capable • C programming & docker containers 	<ul style="list-style-type: none"> • 32-bit 3-core processor • SIL 2, PL d / Cat 3 • Up to 10 MB Flash, 1.5 MB RAM, 32 kB NVRAM • CODESYS, C • Ethernet Responder, CANopen Responder 	<ul style="list-style-type: none"> • Extremely Powerful 64-bit CPU and 32-bit MCU • Up to 64 GB Flash, 16 GB RAM • CODESYS, C, docker containers • High-performance edge computing • Functional safety support for mixed criticality systems 	
I/O	32 (16/16)	69 (35/34)	69 (35/34)	5	5	up to 100 (49/51)	up to 16	
Connections	2 x CAN	2 x CAN	2 x CAN	up to 6 x CAN, 2 x Ethernet, 1 x USB	up to 6 x CAN, 2 x Ethernet, 1 x USB, 4G LTE, WLAN, GPS	up to 6 x CAN (CAN FD capability), Ethernet	up to 6 x CAN (CAN FD capability), Ethernet, 1 x USB	
IP Class	IP69K	IP69K	IP69K	IP67	IP67	IP69K	IP67	
Communication Protocols	EC44: CANopen, SAE J1939 Agri: CANopen, SAE J1939, ISOBUS Responder: CANopen	CANopen, CANopen Safety, SAE J1939	CANopen	CANopen, SAE J1939, NMEA 2000, MODBUS TCP-IP	CANopen, SAE J1939, NMEA 2000, MODBUS TCP-IP	CANopen, CANopen Safety, J1939, J1939 Safety, ISOBUS	CANopen, CANopen Safety, J1939, J1939 Safety	

EPEC Display Units

- Embedded displays with touch screen for mobile machines
- All displays include panel and pedestal mounting possibilities
- Versatile connections enabling different HMI solutions
- Epec SW & Solution support streamlining the development work and enabling for example IoT and fleet management
- CODESYS / C / C++ / Qt programmable
- Customized products according to user needs
- Turn-key solutions according to user needs



For more information about Epec and our display offering, visit epec.fi

Product	Epec 4,3" Display Unit	Epec 6505 Display Unit	Epec 7" Display Unit	Epec 6807 Display Unit	Epec 6510 Display Unit	Epec 6512 Display Unit
						
Display Type	Capacitive 4,3" PCAP, Optical bonding,	Capacitive 5" PCAP, Optical bonding	Capacitive 7" PCAP, Optical bonding	Capacitive 7" PCAP, Optical bonding	Capacitive 10,1" PCAP, Optical bonding	Capacitive 12,1" PCAP, Optical bonding
Resolution	480 x 272, WQVGA	800 x 480, WVGA	800 x 480, WVGA	800 x 480, WVGA	1280 x 800, WXGA	1280 x 800, WXGA
Brightness	800 nits	800 nits	1000 nits	800 nits	1000 nits	1100 nits
Connections	2 x CAN, 1 x USB	2 x CAN, 1 x USB, 1 x RS-232, Ethernet available via USB	2 x CAN, 1 x USB	2 x CAN, 2 x Ethernet, 2 x USB, 1 x RS-232, 2 x camera input	4 x CAN, 1 x Ethernet, 2 x USB, 1 x RS-232, 2 x camera input	3 x CAN, 2 x Ethernet, 2 x USB, 2 x RS-232
I/O	KL15 wakeup input	KL15 wakeup input	KL15 wakeup input	6 + KL15 wakeup input	KL15 wakeup input	KL15 wakeup input

* Available with/without touch and with/without buttons

* Available with/without touch and with/without buttons

EPEC Agriculture Solutions

Epec offers agricultural industry advanced, reliable, and customizable technology solutions. From ISOBUS certified control units to displays, telematics and assistance systems, our products and services are designed to meet the evolving needs of modern farming machines. We deliver both off-the-shelf products, customized products and tailored system development services to ensure your machines are always a step ahead.

All Epec ISOBUS control units can be used in agriculture implements as a standalone unit or as a gateway unit between ISOBUS and another communication protocol. The control unit's set-up and application programming is streamlined with Epec system development toolchain, including the needed ISOBUS libraries.

Epec's ISOBUS solution supports:

- **ISOBUS VT client (VT version 2-3)**
- **ISOBUS TC client (TC version 3)**
- **ISOBUS Tractor-ECU (TECU class 1-2) interface**
- **ISOBUS Diagnostics**
- **ISOBUS AUX-N Functions**

For more information about agri solutions,
visit epec.fi/agri-solutions/



ISOBUS CERTIFIED CONTROL UNITS

- Epec EC44 Agri Control Unit (CODESYS 3.5)
- Epec SL8X Control Unit (CODESYS 3.5)
- Epec SM8X (CODESYS 3.5)
- Epec 3606 Control Unit, Epec 3610 Control Unit, Epec 3724 Control Unit (CODESYS 2.3)



TERMINAL HMIS

- Epec 4,3" Display
- Epec 7" Display



TELEMATICS AND ASSISTANCE

- Epec 6200 Remote Access Unit
- Epec Core Unit
- Epec XS6C Central Unit



ELECTRIC / HYBRID-ELECTRIC SYSTEMS

- Epec Flow Power Distribution Units



EPEC Connectivity Solutions

FULL VISIBILITY OF MACHINE DATA TO IMPROVE UP-TIME, PRODUCTIVITY & EFFICIENCY

- Epec provides IoT solutions including HW and SW products.
- Remotely access machine fleet KPIs (key performance indicators) and diagnostics
- Enables local and remote data analysis to develop, for example, assistance systems

EPEC EDGE:

For customers needing a data pipeline, Edge computing and capability to interact and send data to customer's own Microsoft Azure based environment.

IOT DATA CLOUDS

CONNECTIVITY
SERVICE

REMOTE MAINTENANCE

EPEC GATE:

- VPN like secure connection to machine data and control units
- Web portal for controlling users and privileges
- Remote CAN connection
- Enables using smartphone as a machine HMI
- Tools to access IP network: FTP, SSH, CODESYS IDE



EPEC Customized Products

Example: Battery Management System

- For machines and vehicles with low voltage and high voltage systems
- BMS protects the battery by monitoring and regulating the charging, and by monitoring battery's state, environment, remaining operating time and other characteristics (such as state-of-charge, state-of-health and state-of-function)
- Needed data from the system is collected, calculated and reported to be used for the system's needs, enabling the battery's optimal use
- Integrates and communicates seamlessly with the machine / vehicle communication system enabling data flow between motor, transmission and other relevant components
- Supports different battery cell chemistries (such NMC, LTO and LFP)
- Flexible solution for software-based safety functions
- Safety companion chip to release processing power for the application
- Certified according to needs, such as IEC 61508 and ISO 26262
- Scalable for different solutions
- Designed for very harsh environment
- Fully validated solution for machines and vehicles
- Equipped with Automotive certified components
- Epec SW & Solution support

Feature	Value
Power	Nominal supply voltage 12/24 VDC systems
Interfaces	2 x CAN, 2 x Isolated SPI
Diagnostics	Signal LED (green/red/blue) Supply voltage Unit temperature Internal voltage monitoring Software cycle time Error logging
Protection functions	Overvoltage protection up to 60 V Short-circuit protection for outputs
Safety	Up to SIL 2 and PL d, as a standalone controller using Cat 3 architecture 32-bit multicore processor with lock-step processing and memory protection for the application
Communication Protocols	CANopen, CANopen Safety, SAE J1939

For more information about
Epec and our offering, visit epec.fi



EPEC Systems

Autonomous and Assistance Systems

Electric and Hybrid Electric Vehicle Systems

Epec Systems offering includes:

- Project Management with seamless integration to OEM and needed project teams
- System engineering & simulations at vehicle level
- Development and manufacturing of components:
 - Complete machine control system
 - SW development
 - Needed HW, such as AI or Assistance Control Unit, Hybrid Control Unit, Power Distribution Unit, Battery Management System
- Testing & Validation support for complete vehicle
- Functional safety know-how (IEC 61508 & ISO 26262)



EPEC Control system SW development

Epec control system SW development services provide control system software projects for heavy duty applications such as non-road mobile machines (NRMM) and commercial vehicles. All SW solutions are built on Epec's deep knowledge of the world's best NRMM machines and commercial vehicles from various OEMs within last decades.

Epec has proven capability to deliver future technology solutions that make a difference.

Epec control system SW development's key offering:

- System requirements definition
- Software architecture
- Software specification
- Software development work
- Integration testing
- System validation and testing
- Knowhow of future technologies like electromobility & autonomous assistance systems
- Functional safety knowhow

 **SANDVIK**

Metso

PONSSE

TANA
From Waste to Value®

Orkel



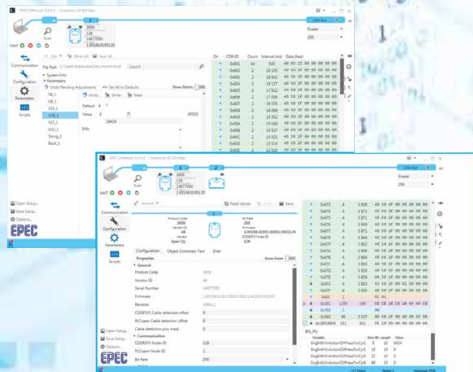
EPEC Software Development Kit

Epec's goal is to make control system application development easy, fast and error-proof for our customers.

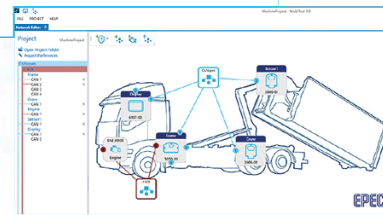
For this Epec has developed a set of helpful software development tools:

- MultiTool Creator - Configuration tool for Epec units
- MultiTool Simulator - Virtual testing environment for Epec control systems
- MultiTool Diagnoser - Diagnostics tool for Epec units
- Programming Libraries - Ready-to-use programming blocks
- Comprehensive programming manuals

Epec development environment complies with functional safety requirements set by the EU Machinery Directive 2006/42/EC.



Unit Number	Variable Name	Start	Controls	Stop	Interval	Connectors	Cell End
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0
1	Frame_Supervisor	0	0	0	0	0	0





Contract manufacturing

Epec provides comprehensive contract manufacturing services to support OEMs' built-to-print needs. We manage the entire process, from product development to production and logistics, ensuring quality and efficiency at every stage.

Our capabilities include:

- Product Design & Development – Turning concepts into manufacturable products
- Engineering Validation & NPI (DfX) – Ensuring optimal performance and production readiness
- PCBA & Component Sourcing – High-quality assembly and procurement
- Logistics & Supply Chain Management – Streamlined global distribution

To ensure reliability and compliance, we also offer:

- Reliability & Environmental Testing – Verifying product durability
- Quality Assurance & Verification – Meeting industry standards and customer specifications

Our ESF1 factory in Finland is a state-of-the-art, smart and sustainable manufacturing facility. We utilize advanced automation, energy-efficient processes, and sustainable practices to deliver high-quality, responsible manufacturing solutions. With Epec's expertise, OEMs can achieve cost-effective, high-quality manufacturing with a reliable partner.

Quality & Cybersecurity

Epec is committed to high-quality manufacturing and robust cybersecurity. Our operations follow ISO 9001, IATF 16949, ISO 14001 and ISO 45001 standards, ensuring consistent, sustainable and safe production. We also follow machine safety and functional safety standards.

Additionally, our ISO/IEC 27001:2022 certification (DNV GL) guarantees compliance with international information security standards, safeguarding data at every level.

ESF1

Epec Smart Factory 1

Epec's smart & sustainable new factory was completed in 2023, targeting CO2 neutrality during its use.

ESF1 Facts:

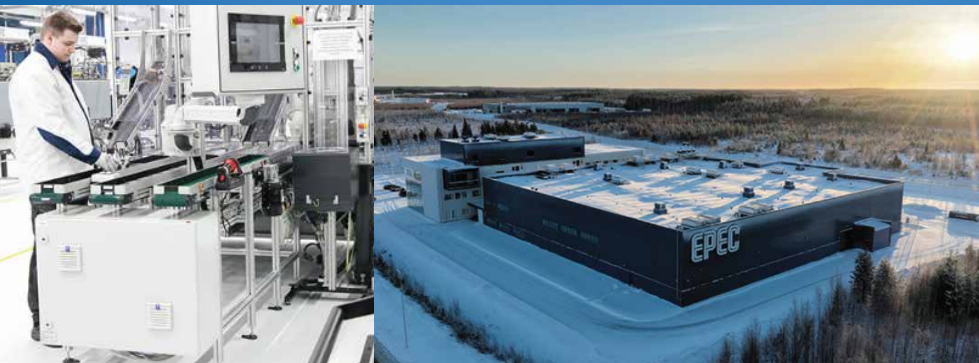
- 8500 m², located in Finland
- Factory meets the most demanding customer requirements and standards
- Over 600 solar panels generate electricity (210 MWh / year)
- Common areas are heated by a geothermal system
- Heat generated by the factory is recovered by efficient needle heat exchangers.
- Need for cooling energy will be significantly reduced by an aluminium grille on the office wall
- All electricity and heating energy is sourced from certified renewable resources
- Improved working conditions, work safety and production flow & efficiency

EPEC

Sustainability

Epec is committed to strive for sustainability. Our sustainability efforts include a focus on reducing the environmental impact of our products and operations. We are committed to improving the energy efficiency of our products and reducing waste throughout our supply chain. Epec is included in Ponsse's yearly sustainability report.

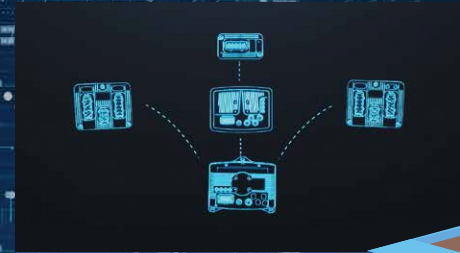
Additionally, Epec aims to promote sustainable practices in the industries it serves, such as mining, construction, agriculture, forestry, and commercial vehicles. Our products help optimize resource use and reduce environmental impact in these demanding sectors.



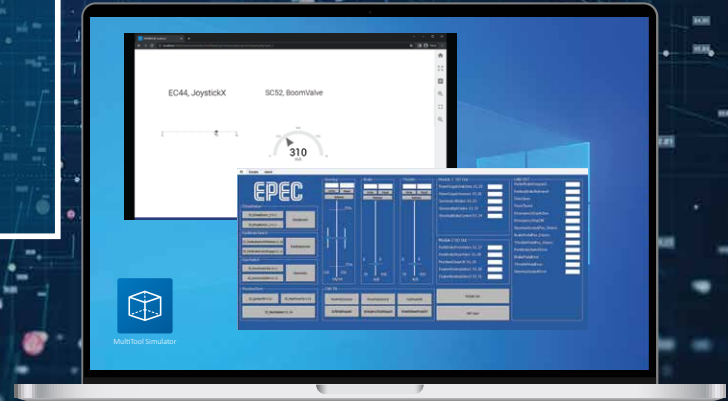
EPEC MultiTool Simulator

MultiTool Simulator is a virtual testing environment for Epec control systems enabling:

- Less / no hardware simulators
- Less development testing on the actual machine
- Software-in-the-loop (SIL) testing
- Accelerated SW design:
 - Start the development earlier without the actual HW
 - Tests can be automated or run remotely
 - Quick and easy configuring
- Seamless integration between Epec software tools
- Multiple users using the same simulated system
- Python API to control machine functions, automated testing and to build test UIs:
 - Qt, Python, Robot Framework etc



Virtualized machine control system with virtual control units



EPEC References

Epec serves a wide range of OEM customers from different industries. Epec products and solutions are used in mining, construction, agriculture, material handling, automotive, forestry and municipal vehicle sectors.



Ponsse



Agrifac



Liebherr



Sandvik



Husqvarna



Multilift



Metso



Stinis



**CE Engineering
Solutions**



Tana



Vestergaard



Orkel



EMOSS



Junkkari



NT Liftec



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